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Original Research Article

IMPACT OF INTERNET GAMING DISORDER ON SLEEP QUALITY AND DISSOCIATIVE SYMPTOMS AMONG UNDERGRADUATE MEDICAL STUDENTS

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ABSTRACT

Background: Internet Gaming Disorder (IGD) is increasingly prevalent among youth, including medical students who are vulnerable due to academic stress and erratic schedules. IGD is associated with poor sleep quality and dissociative symptoms, but limited research exists on their co-occurrence in medical students. **Materials and Methods:** A cross-sectional observational study was conducted among 510 undergraduate MBBS students at Rama Medical College, Kanpur. Participants were assessed using the Internet Gaming Disorder-9 Short Form (IGD-9 SF), Pittsburgh Sleep Quality Index (PSQI), and Dissociative Experience Scale-II (DES-II). Based on IGD-9 SF scores, students were categorized into IGD (n=67) and non-IGD (n=443) groups. Statistical comparisons were made using t-tests and chi-square tests, with significance set at $p<0.05$. **Result:** IGD prevalence was 13.4%. IGD group had a higher proportion of males (80.6% vs 60.0%, p=0.001) and urban residents (65.7% vs 44.9%, p=0.003). Mean PSQI scores were significantly higher in the IGD group (9.2±1.5) compared to non- IGD (5.8±1.2), $p<0.001$; poor sleep was more prevalent (82.1% vs 42.0%, $p<0.001$). Mean DES-II scores were higher in the IGD group (38.6±9.3 vs 24.7±8.1, $p<0.001$), with clinically significant dissociation seen in 56.7% vs 16.9% ($p<0.001$). **Conclusion:** IGD is associated with poor sleep quality and heightened dissociative symptoms among medical students. Early screening and targeted interventions are essential.

INTRODUCTION

The rapid proliferation of digital technologies and widespread internet accessibility have led to the emergence of online gaming as a predominant form of recreation globally. While gaming can provide entertainment and opportunities for social interaction, excessive engagement may give rise to maladaptive behaviours collectively termed Internet Gaming Disorder (IGD). This condition is characterized by persistent and compulsive gaming behaviours that cause significant disruptions in personal, academic, and social functioning.[1,2] Recognizing the growing clinical relevance of this phenomenon, the World Health Organization has officially classified gaming disorder as a mental health condition, highlighting the importance of further research into its psychological and social consequences.[3]

Among various populations, medical students are particularly susceptible to developing IGD due to the unique stressors they face, including rigorous academic demands, irregular schedules, and chronic psychological stress inherent in medical training. These factors may predispose them to seek coping mechanisms such as excessive gaming, which can interfere with vital physiological processes like sleep.[4,5] Sleep disturbances observed in individuals with IGD commonly include delayed sleep onset, shortened total sleep duration, and diminished sleep quality. Such disruptions have been shown to negatively affect cognitive functioning, emotional stability, and academic performance—areas critical for success in medical education.[6,7] Importantly, existing evidence indicates that medical students experience higher rates of poor sleep quality compared to their non-medical peers, underscoring the significance of examining IGD-related sleep issues.[5,8]

In addition to sleep problems, IGD has been associated with dissociative symptoms—experiences marked by disruptions in consciousness, memory, identity, and perception, often manifesting as feelings of detachment from oneself or the

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environment.[9] These symptoms tend to be aggravated by stress and compromised sleep quality. Dissociation is increasingly conceptualized not only as a potential consequence but also as a contributing factor in behavioural addictions such as IGD, as individuals may resort to gaming as a means of escaping psychosocial distress and emotional dysregulation.[10,11] The bidirectional relationship between IGD-induced sleep disturbances and dissociative experiences suggests a complex interplay that may exacerbate the challenges faced by medical students.

Moreover, gender differences in gaming behaviours and related psychopathology have been documented. Emerging findings suggest that female individuals may exhibit higher levels of dissociative traits connected to escape-oriented gaming motivations, adding another layer of complexity to understanding IGD's impact.[12]

Despite growing insights into the individual aspects of IGD, sleep disruption, and dissociation, there remains a paucity of comprehensive research examining their combined effects and potential interactions, particularly within vulnerable groups such as medical students. Addressing this gap, the present study seeks to systematically investigate the relationship between Internet Gaming Disorder, sleep quality, and dissociative symptoms in undergraduate medical students using validated assessment instruments. Gaining a clearer understanding of these interrelated factors is essential for developing targeted prevention and intervention strategies aimed at promoting the mental health and academic success of this high-risk population.

MATERIALS AND METHODS

This cross-sectional observational study was done in the Department of Psychiatry at Rama Medical College, Hospital & Research Centre, Kanpur. The study population included undergraduate MBBS students from all academic years. A total of 550 students were approached, of which 40 did not provide consent, resulting in a final sample of 510 participants. The sample size was determined based on feasibility while ensuring meaningful comparison between groups. Participants were categorized into two groups based on their scores on the Internet Gaming Disorder-9 Short Form (IGD- 9 SF): the IGD group, comprising students with scores ≥32 (showing probable IGD), and the non-IGD group, comprising students scoring <32.

Undergraduate MBBS students aged 18 years and above, and regular engagement in internet- based gaming, defined as playing online games at least three times per week for the past six months were included in the study. Students with history of any diagnosed psychiatric illness (self-reported or documented), past or current substance use disorder, and the presence of chronic medical or neurological illness or ongoing use of medications known to affect sleep or cognition were excluded from the study.

A sociodemographic and clinical proforma was used to collect information on age, gender, academic year, and residence. The Internet Gaming Disorder-9 Short Form (IGD-9 SF),[13] was used to assess gaming behavior; it consists of nine items rated on a 5-point Likert scale, with total scores ranging from 9 to 45. A score ≥32 was used to identify probable IGD cases. Sleep quality was assessed using the Pittsburgh Sleep Quality Index (PSQI),[14] a 19-item instrument measuring various components of sleep over the past month. A global PSQI score >5 show poor sleep quality.

Dissociative symptoms were evaluated using the Dissociative Experience Scale-II (DES- II),[15] a 28-item self-report questionnaire where each item is rated from 0% to 100% to reflect the frequency of dissociative experiences.

Following approval from the Institutional Ethics Committee of Rama Medical College, data were collected during routine academic sessions. The purpose of the study was explained to all potential participants, and written informed consent was taken. Participants completed the structured proforma, IGD-9 SF, PSQI, and DES-II scales. Based on their IGD-9 SF scores, they were classified into IGD and non-IGD groups for further analysis.

Data analysis was done using IBM SPSS version 26.0. Descriptive statistics, including mean, standard deviation, frequency, and percentage, were used to summarize the demographic and clinical profiles of participants. Independent samples t-tests were used to compare mean PSQI and DES-II scores between IGD and non-IGD groups. Chi-square tests were applied to examine differences in categorical variables, such as the proportion of students with poor sleep quality and clinically significant dissociative symptoms. Pearson's correlation coefficient was calculated to assess the relationship between IGD severity and scores on the PSQI and DES-II. A p-value of <0.05 was considered statistically significant.

RESULTS

A total of 550 undergraduate MBBS students were approached, of whom 510 gave consent and were included in the study. Based on the IGD-9 SF scores, 67 students (13.4%) were classified as having probable Internet Gaming Disorder (IGD group), while 443 students (88.6%) formed the non-IGD group.

Table 1: Sociodemographic Characteristics of Participants

Variable	IGD Group (n=67)	Non-IGD Group (n=443)	p-value
Male	54 (80.6%)	266 (60.0%)	0.001*
Female	13 (19.4%)	177 (40.0%)	
Mean Age (years)	21.3 ± 1.2	20.5 ± 1.3	0.002*

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Urban Residence	44 (65.7%)	199 (44.9%)	0.003*

[Table 1] shows the sociodemographic characteristics of the participants. A significantly higher proportion of males was found in the IGD group (80.6%) compared to the non-IGD group (60.0%) with a p-value of 0.001. Conversely, females were less represented in the IGD group(19.4%) than in the non-IGD group (40.0%). The mean age of students in the IGD group was 21.3 ± 1.2 years, which was significantly higher than the non- IGD group with a mean age of 20.5 ± 1.3 years (p = 0.002). Urban residence was more common among the IGD group (65.7%) than the non-IGD group (44.9%), and the difference was statistically significant (p = 0.003).

Table 2: Comparison of Sleep Quality Between IGD and Non-IGD Groups

Variable	IGD Group (n=67)	Non-IGD Group (n=443)	p-value
PSQI Score (Mean ±SD)	9.2 ± 1.5	5.8 ± 1.2	<0.001*
Poor Sleep Quality n (%)	55 (82.1%)	186 (42.0%)	<0.001*

[Table 2] compares the sleep quality between the IGD and non-IGD groups. The mean PSQI score was significantly higher in the IGD group (9.2±1.5) than in the non-IGD group (5.8±1.2), showing poorer sleep quality (p<0.001). A greater proportion of students in the IGD group (82.1%) has poor sleep quality compared to 42% in the non-IGD group, and the difference was statistically significant (p<0.001).

Table 3: Comparison of Dissociative Symptoms Between IGD and Non-IGD Groups

Variable	IGD Group (n=67)	Non-IGD Group (n=443)	p-value
DES-II Score (Mean±SD)	38.6 ± 9.3	24.7 ± 8.1	<0.001*
Clinically Significant Dissociation n (%)	38 (56.7%)	75 (16.9%)	<0.001*

[Table 3] shows the comparison of dissociative symptoms between the two groups. The mean DES-II score was substantially higher in the IGD group (38.6±9.3) than in the non-IGD group (24.7±8.1), with the difference being statistically significant (p<0.001). Clinically significant dissociation was seen in 56.7% of the IGD group, in contrast to only 16.9% of the non-IGD group (p<0.001).

Table 4: IGD Severity and Gaming Behaviour

IGD Severity	Gaming ≥5 days/week n (%)	Gaming >3 hrs/day n (%)
Mild (n = 20)	12 (60.0%)	9 (45.0%)
Moderate (n = 25)	19 (76.0%)	16 (64.0%)
Severe (n = 22)	19 (86.4%)	17 (77.3%)
Total (n = 67)	50 (74.6%)	42 (62.7%)
p-value	<0.001	<0.001

[Table 4] shows significant association was seen between IGD severity and gaming behavior. As IGD severity increased from mild to severe, the proportion of participants gaming ≥5 days per week and >3 hours per day also increased. Overall, 74.6% of IGD participants reported gaming≥5 days a week, and 62.7% reported gaming>3 hours a day, with both associations being statistically significant (p < 0.001).

Table 5: Correlation of Internet Gaming Disorder Scores with Sleep Quality, Dissociative Symptoms, and Gaming Behaviour

Variable	Pearson Correlation (r)	p-value
IGD score vs PSQI	0.52	<0.001*
IGD score vs DES-II	0.61	<0.001*
IGD score vs Gaming Frequency ≥5 days/week	0.58	<0.001*
IGD score vs Gaming Hours >3/day	0.64	<0.001*

[Table 5] shows the correlation between IGD (Internet Gaming Disorder) scores and various psychological and behavioral variables. A moderate positive correlation was observed between IGD scores and PSQI (Pittsburgh Sleep Quality Index) scores (r = 0.52, p < 0.001), showing that higher IGD severity is associated with poorer sleep quality.

A stronger correlation was found between IGD scores and dissociative symptoms as measured by the DES-II (Dissociative Experiences Scale-II) (r = 0.61, p < 0.001), showing a significant link between gaming disorder and dissociation.

Additionally, gaming behavior variables were significantly correlated with IGD scores. A strong positive correlation was found with gaming more than 3 hours per day (r =0.64, p <0.001) and gaming on 5 or more days per week (r = 0.58, p < 0.001). These findings shows the association between increased gaming time and frequency with the severity of IGD and its related psychological impacts.

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DISCUSSION

In the present study, the prevalence of Internet Gaming Disorder (IGD) among undergraduate medical students was found to be 13.4%. A significantly higher proportion of affected individuals were male (80.6%), indicating a strong gender disparity. While this figure represents the distribution of gender within the IGD group, it is in line with existing literature that consistently reports a higher prevalence of IGD among males. Prior studies, by Al Asqah et al,[16] and Singh et al,[17] have demonstrated that male students are more likely to meet IGD criteria compared to females. This gender-based difference is often attributed to higher engagement with gaming platforms, preference for competitive game genres, and sociocultural factors that reinforce gaming behaviors in males. The present findings further support the role of male gender as a potential risk factor for problematic gaming in student populations.

Regarding age, the mean age of students with IGD in this study was 21.3 ± 1.2 years, which is higher than the mean age of 20.5 ± 1.3 years in the non-IGD group ($p = 0.002$). The association could be attributed to cumulative exposure to gaming over time or evolving behavioral patterns with academic progression. However, age-related associations with IGD vary across studies. While Al Asqah et al,[16] found no significant age difference among Saudi medical students, other research in broader university populations, such as De Pasquale et al,[11] noted increased IGD risk among those aged 18 to 25 years. Similarly, Siste et al,[18] and Shouman et al,[19] reported prevalence rates among young adult students within this age bracket. These discrepancies highlight the need for further research into factors such as academic stress and coping mechanisms that might modulate IGD risk in young adults.

In terms of clinical outcomes, medical students with IGD demonstrated significantly poorer sleep quality compared to their non-IGD peers, as evidenced by a higher mean Pittsburgh Sleep Quality Index (PSQI) score (9.2 ± 1.5 versus 5.8 ± 1.2; $p < 0.001$). Furthermore, 82.1% of the IGD group reported poor sleep quality, compared to 42.0% in the non-IGD group ($p< 0.001$). These findings are consistent with studies such as Wong et al,[20] which highlighted the detrimental impact of IGD on sleep quality, and Hammad et al,[21] who reported strong correlations between internet addiction and sleep disturbance among medical students. Poor sleep in this population may impair cognitive functioning and academic performance, exacerbating the negative consequences of IGD.

Dissociative experiences were also significantly more common in the IGD group, with a mean Dissociative Experiences Scale-II (DES-II) score of 38.6 ± 9.3 compared to 24.7 ± 8.1 in non-IGD students ($p < 0.001$). Clinically significant dissociation was observed in 56.7% of students with IGD versus 16.9% of those without ($p < 0.001$). Although literature directly linking IGD to dissociation is limited, De Pasquale et al,[11] found positive associations between IGD risk and dissociative phenomena, including depersonalization. These results may reflect the immersive and escapist aspects of excessive gaming, which can foster detachment from reality.

Behavioral patterns further underscored the severity of IGD, with 74.6% of students in the IGD group gaming five or more days per week, compared to 22.1% of the non-IGD group ($p < 0.001$). Additionally, 62.7% of IGD students reported gaming more than three hours daily, in contrast to 16.0% of those without IGD ($p < 0.001$). These usage patterns parallel findings from Siste et al,[18] who identified prolonged weekly gaming hours as a key risk factor for IGD.

CONCLUSION

These findings highlight a robust association between IGD and adverse outcomes such as impaired sleep and heightened dissociative symptoms among medical students. The gender and residence disparities observed further indicate underlying social and environmental influences on IGD risk. Early identification and targeted intervention strategies are imperative to mitigate the psychological and behavioral harms of IGD in this vulnerable population.

Limitations of the Study: This study's cross-sectional design limits the ability to draw causal inferences. The use of self-reported scales may have introduced reporting biases. As the sample excluded individuals with psychiatric or medical comorbidities, the generalizability of findings is limited.

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